



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,792	01/23/2004	Thomas Potrawa	H26949 USA	7926

128 7590 08/20/2004

HONEYWELL INTERNATIONAL INC.
101 COLUMBIA ROAD
P O BOX 2245
MORRISTOWN, NJ 07962-2245

EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
----------	--------------

1774

DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/763,792	Applicant(s) POTRAWA ET AL.	
	Examiner Marie R. Yamnitzky	Art Unit 1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2004 and 26 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>rec'd 26 Apr 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

1. The disclosure is objected to because of the following informalities:

The abbreviation for the fourth compound set forth in Table 1 on page 20 does not correspond to the full name. The compound is not a "2,6" compound. Likewise, the abbreviation "2,6 NBBO" does not correspond to the full name preceding the abbreviation in line 5 of paragraph [00020], in the last two lines of paragraph [00021], in line 2 of paragraph [00034], and in lines 5-6 of paragraph [00042].

In Table 1, "naphthalene" should read --naphthylene-- (fourth and seventh named compounds).

Appropriate correction is required.

2. Claims 1-12 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preamble of each of claims 2-12 is inconsistent with the preamble of claim 1. It is not clear if these claims are drawn to a device or merely to a compound.

It is not clear if claim 2, with claims 3-6 dependent therefrom, is defining a requirement, or merely further defining an option that was set forth in claim 1. That is, it is not clear if the compound of claims 2-6 must be a compound in which R¹ represents a phenyl ring which, in the case of claims 3-6, is further substituted.

It is not clear if claims 7, 8 and 11 are defining a requirement, or merely further defining an option that was set forth in claim 1.

It is not clear if claim 19 is claiming just the device, or claiming a large display in which the device has been incorporated.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 7, 8 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Jacobs et al. (US 3,989,698).

The compound of prior art Example 23 is a compound of present Formula I wherein X and X' are O, and R₁ is a bond. This is the third compound named in claim 12.

The compound of prior art Example 24 is a compound of Formula I wherein X and X' are O, and R₁ is a monocyclic aryl which is a phenyl ring. This is the first compound named in claim 12.

Interpreting claims 7 and 8 as further defining an option rather than as requiring R₁ to be a multicyclic aryl or a monoheterocyclic aryl, the prior art compounds meet claims 7 and 8 since they meet the limitations of the compound defined in claim 1 which allows R₁ to be a bond or a monocyclic aryl.

Interpreting claim 11 as further defining an option rather than as requiring R₁ to be substituted by a halo group, the prior art compounds meet claim 11 since they meet the limitations of the compound defined in claim 1 in which the halo group is optional.

While claim 1 recites “organic light emitting device” and “emitting layer”, the only limitation of the device/layer is the compound of Formula I.

5. Claims 1, 2, 4, 7, 8 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Mura (US 5,560,852).

The compound of prior art Example 1 is a compound of present Formula I wherein X and X' are O, and R₁ is a monocyclic aryl which is a phenyl ring. This is the first compound named in claim 12.

Regarding claim 4, the phenyl group in the prior art compound that corresponds to present R₁ may be substituted with hydroxy as taught at column 1, line 51.

Interpreting claims 7 and 8 as further defining an option rather than as requiring R₁ to be a multicyclic aryl or a monoheterocyclic aryl, the prior art compounds meet claims 7 and 8 since they meet the limitations of the compound defined in claim 1 which allows R₁ to be a monocyclic aryl.

Interpreting claim 11 as further defining an option rather than as requiring R₁ to be substituted by a halo group, the prior art compounds meet claim 11 since they meet the limitations of the compound defined in claim 1 in which the halo group is optional.

While claim 1 recites “organic light emitting device” and “emitting layer”, the only limitation of the device/layer is the compound of Formula I.

6. Claims 1, 2, 6-8, 10-16, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2001-250689.

(Applicant should receive a machine-assisted translation along with the Japanese language document with this Office action.)

The second formula in paragraph [0035], which is "EM4" in paragraph [0056], represents a compound of present Formula I wherein X and X' are O, and R₁ is a monocyclic aryl which is a phenyl ring which is substituted with 4H-3,1-benzoxazin-4-one. This is the fourth compound named in claims 12 and 15.

Interpreting claims 7 and 8 as further defining an option rather than as requiring R₁ to be a multicyclic aryl or a monoheterocyclic aryl, the prior art compounds meet claims 7 and 8 since they meet the limitations of the compound defined in claim 1 which allows R₁ to be a monocyclic aryl.

Interpreting claim 11 as further defining an option rather than as requiring R₁ to be substituted by a halo group, the prior art compounds meet claim 11 since they meet the limitations of the compound defined in claim 1 in which the halo group is optional.

The prior art discloses an organic light emitting device comprising an anode layer, hole transporting layer, emitting layer made of EM4, an electron transporting layer, and a cathode layer. The device emits blue light, thus anticipating the emission of electromagnetic radiation/ intensity of peak wavelength within the range of 400-490 nm. See paragraphs [0055]-[0056], with reference to paragraph [0047] for the layer structure of the device.

The device may be incorporated into a display as taught in paragraphs [0043]-[0044].

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3-5, 7-9, 11, 17, 18, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-250689 as applied to claims 1, 2, 6-8, 10-16, 19 and 20 above, and for the further reasons set forth below.

The prior art does not disclose a specific example of a compound in which the phenyl ring is substituted with fluorine, hydroxy or acetoxy as in present claims 3-5, but does teach that the compound may have substituents such as a halogen, a hydroxy, a carboxyl or an ester group. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make and use compounds for the prior art purposes having a phenyl ring substituted with fluorine, hydroxy or acetoxy as X in prior art general formula (4).

Interpreting claim 7 as requiring R₁ to be a naphthyl, phenanthryl or anthracenyl group, the prior art does not disclose a specific example of a compound meeting claim 7, but does teach that two or more groups of prior art general formula (1) may be connected by an aryl group, with a naphthyl group being explicitly taught as suitable (paragraph [0021]). It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make and use compounds for the prior art purposes having a naphthyl group as X in prior art general formula (4).

Interpreting claim 8 as requiring R₁ to be a pyridine or pyrimidine group, the prior art does not disclose a specific example of a compound meeting claim 8, but discloses a similar compound. The third formula in paragraph [0035] has a pyridine ring in the position

corresponding to present R_1 , but this prior art compound has two methyl substituents that are not present in the compound of present Formula I. Since the prior art teaches that R_{18} - R_{21} of general formula (4) may be hydrogen, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make and use a compound for the prior art purposes that is similar to the compound of the third formula in paragraph [0035], but lacking the two methyl substituents.

The prior art does not disclose a specific example of a compound meeting claim 9, but teaches that in the generic and subgeneric formulae, the variable Z may be NH. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make and use compounds for the prior art purposes in which the compounds are of prior art general formula (4) in which X is NH.

Interpreting claim 11 as requiring R_1 to be substituted by a halo group, the prior art does not disclose a specific example of a compound meeting claim 11, but teaches that the compound may have substituents such as a halogen. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make and use compounds of prior art general formula (4) in which the connecting group X is substituted with fluorine, chlorine, bromine or iodine.

Regarding claims 17, 18, 21 and 22, the device described in paragraphs [0055]-[0056] does not include a host compound in the emitting layer with EM4, but the prior art teaches that the compound may be used as a dopant in combination with a host compound. The prior art does not disclose 4,4''-N,N'-carbazole-biphenyl as a host compound, but 4,4''-N,N'-carbazole-biphenyl is a compound that was known in the art at the time of the invention to be useful as a host

Art Unit: 1774

compound and known to be a blue emitter. It would have been an obvious modification to one of ordinary skill in the art at the time of the invention to utilize the prior art emitting compounds in combination with compounds known to be useful as host compounds. One of ordinary skill in the art would have been motivated to select a blue emitter as a host compound so as to avoid a shift in emission color out of the blue range. It would have been within the level of skill in the art at the time of the invention to determine suitable and optimum combinations of host and dopant compounds.

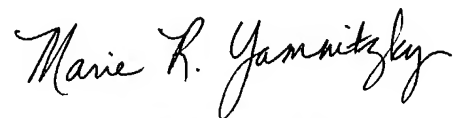
9. Miscellaneous:

In each of claims 12 and 15, the second and seventh compounds listed in the group are the same.

10. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for Art Unit 1774 is (703) 872-9306 for all official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
August 19, 2004



MARIE YAMNITZKY
PRIMARY EXAMINER

1774